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does not give us certain knowledge—knowledge of the particular only, not of the general (*Anal. Post.* I. c. 31). It is for him ground of the higher knowledge of principles, through the intellect or understanding.

I have not been concerned either to justify or to criticise Aristotle's positions as to the criterion of truth, but merely to state or elucidate them, mainly from his own works. I think Aristotle held, though not perhaps in so many words, that the criterion of truth does, in fact, exist, and is found in that objective evidence which determines our assent, and engenders in us certainty of the truth. For him, the evident was true, self-manifesting in variant forms in the realm of primordial fact. Such, I think, was to him the objectivity of truth—truth grounded in the nature of things, and prior to all formal truths or judgments.

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PHILOSOPHIC POSSIBILITIES IN SPACE.

It has been suggested, supposed and even emphatically stated that the universe is finite. The most recent statement concerning the limited nature of the universe was made by Professor Einstein, the modern mathematical wizard. Einstein has traveled in thought through the abysses of space where he discovered new and startling laws and theories of light and gravitation.

It somehow seems contradictory that a mind which is so wonderfully capable of detaching itself from that which is local nevertheless conceives the universe to be a finite something. Yet there are many such minds. One reads occasionally about an astronomer who expresses the hope that some day a giant telescope may reveal the limits of the universe to the eager gaze of man.

Of course, we do not always make ourselves clear as to the definition of the word, universe, which we have in mind. Did Pascal refer to the immensity which consists of matter *and* space when he observed that the universe is an infinite sphere the center of which is everywhere and the circumference nowhere? Does Einstein consider solely the world of suns, planets, stars and comets when he

states that the universe is finite? Does he leave space entirely out of his calculations?

If Einstein does ignore the existence of space, he presents us with the following extra-ordinary spectacle: a cluster of stars and a milky way that whirl in unutterable solitude in an infinite vastness of space. This mass of sun-systems is as a pin-head lost in a boundless immensity. The question arises: Why should the Creating Hand solidify a few suns and planets into this single pin-head when there is room for an infinite number of such pin-heads? What is our physical universe, a single grain of sand suspended in a shoreless ocean?

If Einstein includes space in his calculations, then one cannot but marvel at the absence of logic in a mind which is otherwise so keenly logical. We are, in that case, required to imagine a universe of space and matter which at certain points comes to an abrupt end. Now, we may fool ourselves into believing that we can imagine such a universe. But that same imagination will insist on peeking beyond the boundaries which it, itself, has imposed upon the universe. It will stubbornly inquire whether or not something exists beyond. The inevitable answer to such inquiries is that space, at the very least, is to be found on the other side of the little fence, or wall, or hedge, which our imagination has built around the universe. Of course, we can continue forever to build that imaginary little fence, or wall, or hedge. But we will also continue forever to find at least more space beyond it. In other words, space is infinite.

Now, I am well aware that this last statement is open to criticism. It may be argued that space is not absolutely infinite; that it lacks the existence of the so-called Stellar universe from being an absolutely infinite existence. Space (in this magazine) does not permit me here to show that the statement in question is ultimately correct, and as I intend, further on, to hint at the unity of our apparently heterogeneous universe, I will satisfy the critical mind at present with the following modified statement: The universe of matter and space is infinite. Or, to put it differently: existence in its totality is infinite.

Here, we have, I believe, a truth which will serve as a foundation, beyond comparison solid, for the little structures of Truth which we every once in a while attempt to build. In the first place, it is a self-evident truth; as self-evident as the truth that the shortest line between two points is the straight line. In the second place, it con-

cerns the nature of the whole of existence instead of that of an infinitesimal part of the whole. And when we have obtained an idea of the nature of the whole, the nature of the part and that of the relationship between the part and the whole cannot forever remain an unfathomable mystery.

We have erred in the past either by assuming that the universe is finite or else by ignoring its infinite nature. The intellect will not reach its ultimate aim of understanding solely through concentrating on the study of the part or of a group of parts. It should be guided by the realization that a whole exists, and that the nature of that whole is naturally and inevitably infinite. Such a realization comes easily to him who is able to live in thought beyond the limits of his immediate surroundings and personal interests, beyond the limits of earth and sun-system in the center of a universal vastness. For it is the endlessness of this vastness which will suggest to him the possibility of ultimately solving some of the deeply hidden mysteries of existence in its depths.

To return to the presence of space, which led us to the conclusion that existence in its totality is infinite: a curious fact concerning it is, that the mind *cannot think it away*. Imagination is capable of scattering the beauties of the flower, of destroying the sun, of obliterating the starry hordes. But the most elastic imagination is absolutely incapable of destroying the existence of boundless space. It takes away that illimitable vastness merely to find that another infinite vastness has taken its place. Space is indestructible.

Now, instead of endeavoring to imagine its destruction, let us try to imagine its creation. The mind meets with the same peculiar difficulty. It is absolutely incapable of conceiving a condition of no-space. Space is uncreated. Apparently then space is eternal in its existence. The self-evidence of this truth rather forces itself upon our minds, provided of course that we think about space at all. And it seems to have forced itself upon the minds of the ancients who took its presence, or rather, omnipresence, for granted. The Babylonians, for instance, caused Apsu and Tiamat to create an army of monster-gods who peopled the "waters of the deep." But they did not so much as hint at the origin of the "deep." The deep was conveniently there. And in Genesis, Jahveh created the heaven and the earth, and darkness was on the face of the deep. Again the deep existed before the dawn of creation.

We have come face to face with eternity on another occasion, *viz.*, in our laboratory. It was discovered there that matter is indestructible, and that its amount in the universe is for ever the same. Of course, when we accept the story of creation we are forced to conclude that the universe of matter was destined to exist eternally after a certain moment. Prior to that moment it did not exist. This is palpably absurd. It is just as ridiculous to conceive of infinite duration with a beginning as it is to conceive of infinite space with a starting point. That which will exist eternally in the future has existed eternally in the past. It is a strange immortality that needs to be born!

When we state therefore that matter is indestructible, we clothe in different words the sublime fact that the universe of matter in its totality is absolutely eternal. The whole never changes, the parts do. Now, it will be agreed that the existence of two eternities is a logical impossibility. It follows then that the eternity of matter is identical with that discovered in space. A single eternity pervades matter and space alike. And when two seemingly separate existences are both eternal, they are fundamentally one and the same existence. Our apparently heterogeneous universe of matter and space is a unit—a single existence of a uniform fundamental nature.

This last conclusion follows immediately from the fact that something exists which is infinite in its totality. We have seen that the totality of existence is boundless. This being so, there can be no question of several separate and independent existences composing the universe. The single thing which is infinite as a whole is the only thing that can possibly exist. Its presence excludes the possibility of the existence of one or more things beyond the infinity of that presence. Space and the stellar universe are solidly linked by the bond of an ultimately identical fundamental substance.

Pascal's brilliant definition of the universe may therefore be modified as follows: The universe, an infinite—eternal sphere of substance, the center of which is everywhere and the circumference nowhere. I shall not here attempt to discuss the possible nature of this fundamental "substance." It is merely my aim in this article to show that a little thought on space may reveal the fact that enormous possibilities of truth lie concealed in its depths. Nor do such truths differ greatly from the truths concerning existence which we hitherto have accepted on faith by failing to derive them from fact and reality.

Let me suggest that infinity, omnipresence and eternity are to be definitely located in the universe. They *are* existence in its totality. In the light of cosmic philosophy such attributes emerge from the abstract into the real. In the past we have paid too much attention to ourself, to its future existence in a hereafter, and to the Power that determines the nature of that future existence. We possessed a deity principally because we were in need of one. We erected his throne anywhere beyond the supposed limits of this mortal world, and endowed him with the attributes of infinity and eternity. But these attributes were meaningless to us, even as our Supreme Power, though we intuitively realized the necessity of his existence, could be associated with reality only with the utmost difficulty.

All this is due to the fact that evolution had not as yet coaxed man from his shell of self-centeredness. On the whole, man lives in a little universe of his own making; a little universe bounded by the limits of self-interest. What lies beyond these limits, lies also beyond the limits of his intellectual powers. How many of us, to-day, look at the stars without seeing them? How often do we not babble learnedly about the infinite and the eternal without suspecting in the least that we daily face these realities: without suspecting that we live, move and have our being *in* them?

However, evolution constantly urges man to live in an ever-broadening universe. Contact with life wears off some of the hardness of that shell of self-centeredness. Experience, and principally that experience which is the product of struggle, adds little by little to the size of the world in which he lives. History teaches nothing but just that. It records man's struggles with nature, and subsequently with organized society. It records the gradual development of the mind and a corresponding growth of the universe which the mind is contemplating. Less thought of self, and more thought of the balance of existence; less selfishness and more altruism; less ignorance and more understanding—here we have in a nut shell the mysterious aims of human evolution.

That man's mind is broadening by leaps and bounds, and that it is beginning to seek divinity in the infinite reality which constitutes his universal home becomes more and more apparent. Perhaps we should go back as far as Columbus and his discovery of the New World to find the birth of the universal mind. Man became compelled to think in terms of continents instead of in terms of shacks and palaces, in terms of earths instead of in terms of private estates.

Steamships, railroads, telegraph and telephone, wireless, flying machine—are they not the creations of a mind that has learned to fly away from home, from ME, and do they not in turn teach the average man to think thoughts that are broad and universal rather than narrow and local?

Copernicus, Galileo, Newton, and their illustrious followers paved the way for the cosmic mind, drew the attention of man to the existence of a stupendously large universe, which he could not very well exclude from his philosophic calculations. The ultimate outcome will be, that divinity will be sought in the one reality beyond which nothing exists, *viz.*, existence in its infinite totality. This statement may at present sound to many ridiculous, if not unreligious. This may be due to the fact that we are not accustomed to live in thought in an infinite universe. Also, we are on the whole rather well satisfied with the deity which the ancients so conveniently conceived for us. But, a little reason will convince us that many objections from a religious point of view might be eliminated. Let us forget, for the moment, the appearance of the universe. Let us forget that such a base, miserable thing as matter is to be found in it. Let us further consider that this infinite is inseparably associated with eternity . . . But, enough! Let the reader think for himself, and decide for himself.

In concluding, it should be remarked that the infinite presents us with a number of truths that are helpful in bridging the wide chasm which seems to separate the part from the whole, the finite from the infinite. Starting from the proposition that existence in its totality is infinite, the following truths suggest themselves:

1. That which is infinite is also eternal.
- 1a. An infinite whole is eternally unchangeable (as a whole).
2. There can exist but one infinite and therefore but one eternity.
3. Given an infinite existence, no other separate and independent existence is possible.
4. An infinite existence is an infinite unit.
5. All individual existence is fundamentally part of the infinite existence.
6. An infinite whole consists of an infinite number of constituent parts.
7. That which is infinite is eternally unchangeable as a whole, but its parts are necessarily subject to constant change.

H. R. VANDERBYL.